## REMARKS/ARGUMENTS

Responsive to the August 18, 2009 Advisory Office Action, claims 23 and 27-35 stand rejected. Claims 27, 28 and 30 have been amended and claims 36-43 are new. Accordingly, claims 23 and 27-43 remain pending for prosecution with claims 27 and 37 being independent and all other claims depending therefrom. Applicant respectfully requests reconsideration of the rejected claims.

### I. CLAIM REJECTIONS UNDER 35 U.S.C. § 103

#### A. Obviousness

When determining the question of obviousness, underlying factual questions are presented which include: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art at the time of the invention; (3) objective evidence of nonobviousness; and (4) the differences between the prior art and the claimed subject matter. Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). Moreover, with regard to the last prong of the *Graham* inquiry, "[t]o determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. To facilitate review, this analysis should be made explicit." KSR International v. Teleflex Inc., 127 U.S. 1727 (2007).

Applicant does not contest that the references that have been cited and relied on by the Examiner have at least marginal pertinence to the particular problem(s) solved by the present

invention in that the references disclose methods for treating or vaccinating animals. Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1535, 218 USPQ 8781, 8786 (Fed. Cir. 1983).

The person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art. Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc., 807 F.2d 955, 962, 1 USPQ2d 1196, 1201 (Fed. Cir. 1986). The level of ordinary skill in the art of veterinary compositions and methods for treating animals may be determined by looking to the references of record. In re GPAC, Inc., 57 F.3d 1573, 35 USPQ2d 1116 (Fed. Cir. 1995). The references of record in this case reveal that a moderate level of sophistication in the veterinary arts is associated with one of ordinary skill. Thus, Applicant submits that, as substantiated by the cited references, those with at least a bachelor's degree in chemistry or biochemistry or substantial experience in the veterinary industry or the like would most likely be a person with ordinary skill in this field of endeavor.

With respect to objective evidence of nonobviousness, Applicant re-asserts that the record supports the conclusion that there are long-felt but unsolved needs met by the present invention. A snapshot of the knowledge of a person skilled in the art at the time Applicant filed the patent application for the present invention is summarized in the October 4, 2002 article by Pfizer Global Research and Development entitled Pharmaceutical Challenges in Veterinary Product Development. This article was submitted to the USPTO and identified in the June 25, 2009 Supplemental Information Disclosure Statement. The above-referenced paper provides a "brief review of the animal health pharmaceutical product landscape," "highlights challenges and special consideration in veterinary drug delivery," and "identifies unmet needs in animal health along with recent advances" as the state of the art existed in October 2002. Tablets and injectables were identified as the two most common dosage forms in veterinary applications in

2002. Three major areas of drug delivery needs identified at the time of the Applicant's invention were: convenient delivery for companion animals, long-acting implants and injections, and dosing devices and needle-free injectors.

More specifically, the article identifies the following long-felt needs in a pharmaceutical or vaccine administration method: reducing human and food safety concerns due to "injection site toleration;" a "no needles" method being a high priority need in animal health, particularly in livestock pharmaceuticals and vaccines; and alleviating the risk of injury using traditional methods that are laborious and require animal restraint. This article, however, fails to identify the Applicant's claimed method of applying a prophylactic composition to the exterior of the livestock animal's muzzle as a known administration in the art in its "state of the art" in pharmaceutical and vaccine administration to livestock summary. Moreover, this reference pointedly identifies unmet and long-felt needs in the art at a time subsequent to the present application's filing date. Applicant's invention, therefore, is non-obvious because it satisfies many of the unmet and long-felt needs in the art identified at the time of Applicant's invention.

In particular, the present invention is directed to the particular problem of providing a method for treating livestock with a veterinary composition that does not require animal restraint, eliminates the use of needles, administers the composition to the animal's mucosal membranes, avoids close physical contact with the animal, and provides a visual indicator of vaccination. The present invention does not require a handler to restrain the animal or fight the animal to restrain its head thereby minimizing stress on the animal. Further, the reduced degree of contact between man and animal provided by the present invention greatly reduces risk of injury to both. Additional benefits of the present invention over the prior art include eliminating the use of needles thereby eliminating the risk of spreading blood and skin borne diseases from animal to

animal, injection pain and broken needles in edible tissues, as well as avoiding site reactions which may result in the loss of saleable tissues due to injection site lesions showing up in the final food product.

The present invention also uses the natural route of infection in order to provide a dual system of immune processing through the oral and/or nasal mucosa while minimizing the physical contact between man and animal. The present invention is also cost effective in that it requires minimum reformulation and does not require any new technology for use in connection with respiratory viruses and/or attenuated bacteria. Finally, the present invention allows handlers of large groups of livestock animals to visually identify animals that have already been administered the prophylactic composition. The post-application identifier increases administration efficiency and prevents an animal from being given two doses of the prophylactic composition and also allows the handlers to visually identify animals that have not been administered the prophylactic composition. In summary, the present application is directed to a method of treating livestock that includes applying a single effective dose of a prophylactic composition directly to the exterior of the muzzle of a livestock animal wherein the animal distributes the effective dose into its oral and/or nasal cavities to contact the oral and/or nasal mucosal membranes with its tongue and the method also includes a post-application identifier. These features represent a solution to long felt needs in the art that were not met by the known prior art.

Finally, prima facie obviousness requires that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references. This motivation-suggestion-teaching test informs the Graham analysis. "To reach a non-hindsight driven conclusion as to whether a

person having ordinary skill in the art at the time of the invention would have viewed the subject matter as a whole to have been obvious in view of multiple references," there must be "some rationale, articulation, or reasoned basis to explain why the conclusion of obviousness is correct." In re Kahn, (Fed. Cir. 2006). The KSR International decision by the Supreme Court has not eliminated the motivation-suggestion-teaching test to determine whether prior art references have been properly combined. Rather, in addition to the motivation-suggestion-teaching test, the Court discussed that combinations of known technology that are "expected" may not be patentable. Stated in the affirmative, therefore, combinations are nonobvious and patentable if unexpected. In the present application, no single prior art reference nor any combination thereof meets the claimed limitations or provides an expectation of Applicant's claimed invention.

**B. Rejection of Claims 27, 28, 31, 32, 33 and 35 over Chu in view of Gallili.**

Claims 27, 28, 31, 32, 33 and 35 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chu (US 2002/0025325) in view of Gallili (US 6,541,001 B1). For the following reasons, Applicant respectfully requests reconsideration and withdrawal of these rejections.

Applicants respectfully traverses the assertions that the Chu and Gallili references, alone or as combined, teach or suggest all of Applicant's claim limitations or that the claimed limitations of the present invention are the expected result when Chu and Gallili are combined. Applicant's method of administration of prophylactic compositions is not rendered obvious by the combination of Chu and Gallili for the reasons discussed hereinbelow.

**1. Chu does not teach applying a single effective dose of a prophylactic composition directly to the exterior of the muzzle of a livestock animal wherein the single effective dose is distributed to the oral and/or nasal cavities by the animal's tongue.**

Chu does not teach or suggest applying at least a single effective dose of prophylactic composition directly to the exterior of the muzzle of an animal. Chu does not teach or suggest that the effective dose will be distributed to the oral and/or nasal cavities by the animal's tongue.

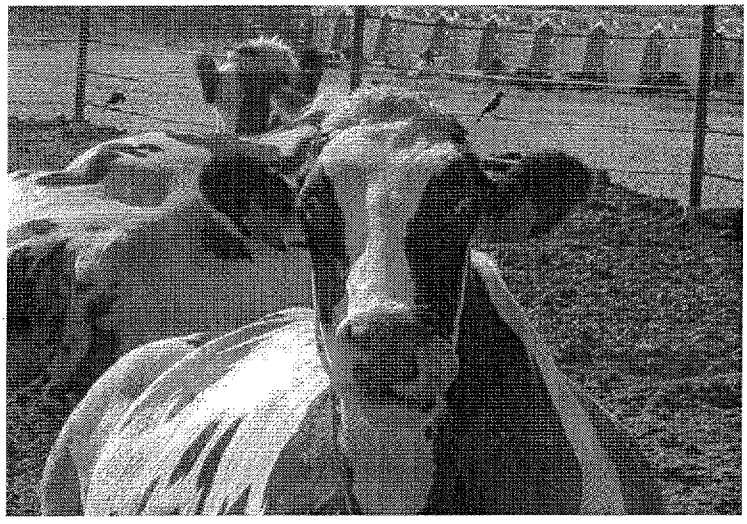
In its plain and ordinary meaning, the term "single" is defined as "consisting of one part" and the term "effective" is defined as "having an intended or expected effect." American Heritage Dictionary, 4th Ed. In addition, a "dose" is "a specified quantity of a therapeutic agent, such as a drug or medicine, prescribed to be taken at one time or at stated intervals." American Heritage Dictionary, 4th Ed. Accordingly, a "single effective dose" of a "prophylactic composition" necessarily requires a specified quantity of a composition in order to have the intended prophylactic effect. For example, for an immunization to fully immunize a subject, an effective dose of an antigen must be introduced into an animal's immune system in order to supply or produce enough antibodies to create immunity to a particular disease. If less than an effective dose is introduced, resulting in less than the expected antibody production, the immunization will, by definition, not be effective because the subject will not have experienced the required immune response to develop the intended immunity to the particular disease. Necessarily, the amount of a single effective dose will vary on the prophylactic composition and may be administered at designated intervals over the life of an animal.

Thus, the Advisory Action's conclusion that "even if all the effective dose is not distributed into the nasal and/or oral cavities by cleaning the muzzle with the tongue, any vaccine ingested will at least be effective to induce some immune response and achieve some positive

effect" is not consistent with the plain meaning of a single effective dose of a prophylactic composition as claimed by Applicant. It is well known in the art that providing reduced doses does not provide effective immunity sufficient to prevent an animal from being affected by the targeted disease.

Moreover, "any vaccine ingested" is certainly not a single effective dose and it does not teach a specific prescribed amount or quantity of the composition other than that applied by chance. The speculated "some positive effect" resulting from "any vaccine ingested" is most definitely not the intended or expected effect based on applying a specified quantity of prescribed prophylactic composition to the exterior of the animal's muzzle.

Moreover, when a livestock animal drinks the water/vaccine mix of Chu, the single effective dose is not being applied directly to the exterior of the animal's muzzle, and the single effective dose is not being distributed to the oral and/or nasal cavities to contact the oral and/or nasal mucosa when the animal cleans its muzzle with its tongue. An example of bovine tongue action is shown below:



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Further, Chu does not teach or suggest a reliance on the tongue to distribute the single effective dose. In fact, the word "tongue" is not present in the Chu disclosure. As a result, Chu's disclosure fails to teach, suggest or motivate a person skilled in the art to apply at least a single effective dose directly to the exterior of a livestock animal's muzzle wherein the livestock animal distributes the single effective dose into its oral and/or nasal cavities to contact the oral and/or nasal mucosa when it cleans its muzzle with its tongue. What is more, Chu does not provide any teaching or suggestion to modify the vaccine administration method of Chu to arrive at the present invention.

**2. Chu teaches away from the claimed invention.**

Chu exclusively teaches that an animal receives a single effective dose of medication through drinking the water/vaccine mix from a bucket or a trough; therefore, Chu necessarily teaches away from directly applying a single effective dose to the exterior of the muzzle as claimed in the instant application. The effective amount of water/vaccine mix is not applied to the exterior of the animal's muzzle. Even if some water/vaccine mix remained on the muzzle of a livestock animal after watering, there would be an insufficient amount of the vaccine present to constitute a "single effective dose." It is impossible for Chu's gallons of water/vaccine mix to be applied to the livestock animal's muzzle in a single application as claimed in the present invention. An effective dose of the water/vaccine mix taught by Chu would involve a substantially greater volume of liquid than could physically be applied to an animal's muzzle as a single effective dose. Further, it is physically impossible for the gallons of the water/vaccine mix necessary to provide an effective dose of Chu's vaccine to be subsequently distributed from the muzzle to the animal's nasal and/or oral cavities by the animal's tongue while the animal is cleaning its muzzle. That is why Chu's composition and administration method teaches away

from Applicant's claimed method of direct application of a single effective dose of a prophylactic composition to the exterior of an animal's muzzle wherein the effective dose is distributed to oral and/or nasal cavities by the animal's tongue.

**3. Gallili does not teach or suggest and, in fact, teaches away from applying at least a single effective dose of a prophylactic composition directly to the exterior of the muzzle of a livestock animal wherein the single effective dose is distributed to the oral and/or nasal cavities to contact the oral and/or nasal mucosa when the animal cleans its muzzle with its tongue.**

Gallili does not teach applying at least a single effective dose of the prophylactic composition directly to the exterior of the animal's muzzle. Gallili teaches that a dose of a prophylactic composition can be administered via a whole body spray applied to the exterior of the animal. This application method teaches away from applying a single effective dose directly to the exterior of the muzzle of the livestock animal. While some of the spray may incidentally hit the muzzle during the whole body spray, the single effective dose applied in Gallili's whole body spray is inherently distributed over the animal's entire body—not applied directly to the exterior of the muzzle. Accordingly, administering a prophylactic composition by spraying it over the whole body of an animal, as taught in Gallili, and applying a single effective dose directly to the exterior of the animal's muzzle as claimed in the present invention are mutually exclusive. That is why Gallili teaches away from the present invention and the present invention would not be the expected result of the combination of the composition of Chu or Gallili with Gallili's whole body spray.

Moreover, Gallili does not teach or suggest a reliance on the tongue to distribute the single effective dose. In fact, the word "tongue" is not present in the Gallili disclosure. As a

result, Gallili's disclosure fails to teach, suggest or motivate a person skilled in the art to apply at least a single effective dose directly to the exterior of a livestock animal's muzzle wherein the livestock animal distributes the single effective dose into its oral and/or nasal cavities to contact the oral and/or nasal mucosa when it cleans its muzzle with its tongue.

Further, as stated above in Section B1, the Advisory Action's conclusion that "even if all the effective dose is not distributed into the nasal and/or oral cavities by cleaning the muzzle with the tongue, any vaccine ingested will at least be effective to induce some immune response and achieve some positive effect" is not consistent with the plain and customary meaning of a single effective dose of a prophylactic composition as discussed in Section B1. "Any vaccine ingested" is certainly not a single effective dose and it does not teach any specific prescribed amount or quantity of the composition other than that applied by chance. The speculated "some positive effect" resulting from "any vaccine ingested," as relied upon in the Advisory Action, is most definitely not the intended or expected effect based on applying a specified quantity of prescribed prophylactic composition to the exterior of the animal's muzzle. For these reasons, Gallili fails to teach, suggest or motivate a person skilled in the art to directly apply at least a single effective dose to the exterior of an animal's muzzle wherein the livestock animal distributes the single effective dose into its oral and/or nasal cavities to contact the oral and/or nasal mucosa when it cleans its muzzle with its tongue.

**4. There is no rationale, articulation, or reasoned basis presented to explain the Office Action's conclusion that the present invention is the expected result when a person of ordinary skill in the art combines the teachings of Chu and Gallili.**

The combination of elements from the references Chu and Gallili as presented in the Office Action does not result in the present invention as claimed. There is no teaching,

suggestion, or motivation in the references that would indicate the present invention would be an expected result of the combination of Chu and Gallili; therefore, the required components of a prima facie case of obviousness have not been satisfied.

Chu and Gallili do not teach, suggest or motivate the application of at least a single effective dose of a prophylactic composition directly to the exterior of the muzzle of a livestock animal wherein the livestock animal distributes the single effective dose to its oral and/or nasal cavities to contact the oral and/or nasal mucosa with its tongue. In fact, both administration methods taught in Chu and Gallili teach away from direct application of a single effective dose to the exterior of the muzzle of a livestock animal. Both references fail to teach or suggest relying on the animal's tongue to distribute the prophylactic composition to its oral and/or nasal cavities to contact the oral and/or nasal mucosa. Imposing this limitation into the Chu and Gallili disclosures is nothing more than hindsight reconstruction as the Office Actions to date have failed to show that this limitation is taught or suggested in the cited references. Moreover, the Office Action still fails to demonstrate that there is any teaching, suggestion or motivation for a person of ordinary skill in the art to reasonably modify the teachings of Chu and Gallili such that the present invention is the expected result of the combination of Chu and Gallili. Accordingly, Chu and Gallili, individually and in combination, fail to teach or suggest all the limitations of the present invention. Therefore, one of ordinary skill in the art would not have arrived at Applicant's claimed invention because Applicant's invention would not be an expected result of the combination of these references. Accordingly, Applicant's independent claims 27 and 37 and the claims depending therefrom are nonobvious.

**C. Rejection of Claim 23 over Chu in view of Gallili and further in view of Emery.**

Claim 23 was rejected under 35 U.S.C. 103(a) as being unpatentable over Chu in view of Gallili, further in view of Emery et al. (US 5,906,826). Per the arguments presented above in Section B, the combination of Chu and Gallili does not establish a prima facie case of obviousness for independent claims 27 or 37 and the claims depending therefrom. In addition, Chu, Gallili, and Emery, alone or in combination do not teach, suggest, or motivate the combination asserted in the Office Action. Emery may teach the use of additives in a prophylactic composition; however, Emery does not teach directly applying at least a single effective dose of such a composition to the exterior of the muzzle of a livestock animal wherein the animal distributes the single effective dose to the animal's oral and nasal cavities with its tongue. Emery contains no suggestion or motivation for this method of application and a person of ordinary skill in the art would not expect the present invention when considering Chu, Gallili, or Emery whether alone or in combination. Therefore, claim 23 of the present invention is nonobvious.

**D. Rejection of Claims 25 and 34 over Chu in view of Gallili and further in view of Demello.**

Claim 34 was rejected under 35 U.S.C. 103(a) as being unpatentable over Chu in view of Gallili, further in view of Demello et al. (US 5,846,830). For the following reasons, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Applicant respectfully traverses the assertion that the Chu, Gallili and Demello references, when combined, teach or suggest all of Applicant's claim limitations or that the claimed limitations of the present invention is the expected result when Chu, Gallili and Demello are combined. Per the arguments presented above in Section B, the combination of Chu and Gallili does not establish a prima facie case of obviousness for independent claims 27 or 37 and

the claims depending therefrom. Moreover, Demello does not teach directly applying at least a single effective dose of a prophylactic composition to the exterior of the muzzle of a livestock animal wherein the animal distributes the single effective dose to the animal's oral and/or nasal cavities with its tongue. Thus, Chu, Gallili, and Demello, alone or in combination, do not teach or suggest every claimed limitation of the present invention, and do not teach or suggest to a person skilled in the art that the present invention is the expected result of the combination as asserted in the Office and Advisory Actions. Accordingly, Applicant's claim 34 is nonobvious.

**E. Rejection of Claims 27, 28, 31, 32, 33 and 35 over Dowling in view of Gallili.**

Claims 27, 28, 31, 32, 33 and 35 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling (US 6,177,082 B1) in view of Gallili (US 6,541,001 B1).

Applicant respectfully traverses the assertion that the Dowling and Gallili references, when combined, teach or suggest all of Applicant's claimed limitations or that the claimed limitations of the present invention are the expected result when combining the Dowling and Gallili reference. Applicant's claimed invention, directed to a method of administration of prophylactic compositions to livestock animals, is not rendered obvious by the combination of Dowling and Gallili. For the following reasons, Applicant respectfully requests reconsideration and withdrawal of these rejections.

**1. Dowling does not teach directly applying at least a single effective dose to the exterior of the muzzle of a livestock animal wherein the single effective dose is distributed to the oral and/or nasal cavities to contact the nasal and/or oral mucosa when said livestock animal cleans its muzzle with its tongue.**

Dowling does not teach directly applying at least a single effective dose of prophylactic composition to the exterior of the muzzle of a livestock animal wherein the single effective dose

is delivered to the nasal and/or oral cavities by the animal's tongue. It is well known in the art that a nebulizer is a device used to administer medication in the form of a mist that is inhaled into the respiratory system. Dowling teaches an influenza vaccine being nebulized into a mist and inhaled by the animal into its respiratory system only after an operator physically restrains a livestock animal's head and places a nebulizer mask over its nose and mouth. While the nebulizer device may be in proximate contact with the muzzle of an animal, and some of the nebulized solution may come into contact with the muzzle, the effective dose of the nebulized composition of Dowling is inhaled into the animal's respiratory system; therefore, the single effective dose is not directly applied to the exterior of the animal's muzzle as claimed by Applicant. Dowling also fails to teach or suggest that the animal's tongue distributes the single effective dose to the nasal and/or oral cavities. In fact, the word "tongue" does not appear in Dowling's disclosure. Accordingly, Dowling's administration method fails to teach or suggest two claimed limitations of the present invention.

**2. Dowling teaches away from the claimed limitations of the present invention.**

Dowling clearly teaches away from the present invention's claimed limitation of directly applying a single effective dose of a prophylactic composition to the exterior of the muzzle of a livestock animal. Dowling teaches that intra-respiratory administration "may be accomplished . . . by use of a nebulizer fitted over the nose and mouth of the animal to be vaccinated." (Col. 13, lines 30-39). Further, Dowling teaches that the effective dose of water/vaccine mix is made into a fine spray or mist by the nebulizer and inhaled by the animal in order to distribute the water/vaccine mix throughout the animal's respiratory system. This teaching contradicts Applicant's method of applying a single effective dose to the exterior of the animal, and

specifically, to the muzzle. Moreover, Dowling does not teach or suggest that the animal distributes the single effective dose to its nasal and/or oral cavity when the animal cleans its muzzle with its tongue as claimed in the present invention. Again, Dowling's method and the method of the present invention are mutually exclusive and, necessarily, the exclusive teaching of one teaches away from the other.

Furthermore, equine nebulizers, known in the art and taught by Dowling, fit snuggly over the nose and mouth and are designed to reduce and minimize dead space to improve the administration of the nebulized medicine. Such nebulizer masks known in the art are found at www.eramask.com and www.aeromask.com and are shown in Exhibit A. This design feature necessarily reduces the ability of the animal to open its mouth. Accordingly, while the nebulizer mask is on and the effective dose is being inhaled by the horse, the animal's ability to open its mouth enough to use its tongue to clean its muzzle is greatly inhibited or even prevented. Thus, the dose of vaccine has already been administered by inhaling the effective dose through the use of a nebulizer and accompanying mask and distributed internally to the animal's respiratory system by the time an animal can clean its muzzle with its tongue. Therefore, it is impossible for the livestock animal to distribute a single effective dose to its nasal and/or oral cavities with its tongue as claimed in the present invention using the nebulizer mask of Dowling. Accordingly, Dowling further teaches away from the claimed limitation of the present invention that the tongue distributes the single effective dose to the nasal and/or oral cavities.

Further, the equine respiratory masks often cause horses to become agitated, which results in the animal being stressed and may involve the animal putting up resistance thereby endangering the handler administering the nebulized medicament. The mask design incorporates a "quick release" strap and the instructions provide for application of the mask without any

attached accessories in order to reduce the stress on the animal and allow the animal to become acclimated to having the mask placed over its muzzle. These precautions teach away from the present invention wherein the method of the present invention reduces stress on the animal by eliminating the need to restrain and handle the animal's head and reduces the animal/handler interaction. The method of Dowling involves substantial handling and restraint of an animal to fit the nebulizer mask onto the head of the animal and involves that restraint for a prolonged period of time causing a livestock animal to experience stress. The equipment disclosed for performing Dowling's nebulizer administration method incorporates safety measures, such as the quick release strap, and specific "stress-reducing" steps instructions to attempt to lessen the inherent stress animals experience upon the use of Dowling's method. Thus, Dowling teaches away from the present invention since it inherently involves the animal experiencing stress by involving substantial handler/animal interaction and requiring the animal's head to be restrained.

**3. Gallili does not teach or suggest and, in fact, teaches away from applying a single effective dose of a prophylactic composition directly to the exterior of the muzzle of a livestock animal wherein the single effective dose is distributed to the oral and/or nasal cavities to contact the oral and/or nasal mucosa when the animal cleans its muzzle with its tongue**

The Examiner is directed to Section B(3) above for Applicant's arguments regarding Gallili's lack of teaching, suggestion or motivation as applied to the present invention.

**4. There is no rationale, articulation, or reasoned basis presented to explain the Office Action's conclusion that the present invention is the expected result when a person of ordinary skill in the art combines the teachings of Dowling and Gallili.**

The combination of elements from the Dowling and Gallili references does not result in the present invention as claimed. There is no teaching, suggestion, or motivation in the references that would indicate the present invention would be an expected result of the combination of Dowling and Gallili; therefore, the required components of a prima facie case of obviousness have not been satisfied.

Neither of the references teaches nor suggests all of the elements of independent claims 27 or 37. It is impossible to apply a single effective dose of a prophylactic composition on the exterior of the muzzle using the administration methods taught by Dowling and Gallili. Dowling and Gallili fail to teach or suggest applying at least a single effective dose to the exterior of the animal's muzzle. Dowling and Gallili fail to teach or suggest that that the single effective dose is distributed to the oral and/or nasal cavities to contact the oral and/or nasal mucosa by the animal's tongue and imposing this limitation into Dowling and Gallili is hindsight reconstruction because the Office Actions to date have failed to show that this limitation is taught or suggested by the cited references. Moreover, one of ordinary skill in the art would not have arrived at Applicant's claimed invention because Applicant's invention would not be an expected result of the combination of these references since both Dowling and Gallili, individually and in combination, fail to teach or suggest all the claimed limitations of the present invention. Accordingly, Applicant's independent claims 27 and 37 and the claims depending therefrom are nonobvious.

**F. Rejection of Claim 23 over Dowling in view of Gallili and further in view of Emery.**

Claim 23 was rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Gallili and further in view of Emery. Per the arguments presented above in Section E,

the combination of Dowling and Gallili does not establish a prima facie case of obviousness for independent claims 27 or 37 and the claims depending therefrom. In addition, Dowling, Gallili, and Emery, individually or in combination, do not teach, suggest, or motivate the combination asserted in the Office Action. Emery may teach additives for use in prophylactic compositions; however, Emery does not teach one skilled in the art to directly apply a single effective dose of such a composition to the exterior of the muzzle of a livestock animal. Further, Emery does not teach or suggest the animal distributing the effective dose to the animal's oral and/or nasal cavities with its tongue. Emery contains no suggestion or motivation to alter the disclosed composition for this method of application, and a person of ordinary skill in the art would not expect the present invention when considering Dowling, Gallili, or Emery whether alone or in combination.

**G. Rejection of Claims 25 and 34 over Dowling in view of Gallili and further in view of Demello.**

Claims 25 and 34 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Gallili and further in view of Demello. Per the arguments presented above in Section E, the combination of Dowling and Gallili does not establish a prima facie case of obviousness for independent claim 27 or the claims depending therefrom. In addition, Demello does not teach directly applying a single effective dose of a prophylactic composition to the exterior of the muzzle of a livestock animal wherein the animal distributes the single effective dose to the animal's oral and/or nasal cavities with its tongue. Thus, Dowling, Gallili, and Demello, alone or in combination, create no reasonable expectation of every claimed limitation of the present invention when the teachings, suggestions and motivations of Demello are added to the combination of Dowling and Gallili. Accordingly, Applicant's claim 34 is nonobvious.

**H. Rejection of Claims 27, 32, 34 and 35 over Squires in view of Reynolds.**

Claims 27, 32, 34 and 35 were rejected under 35 U.S.C. 103(a) as being unpatentable over Squires (US 6,350,784 B1) in view of Reynolds (US 5,753,244). For the following reasons, Applicant respectfully requests reconsideration and withdrawal of these rejections.

**1. Squires does not teach, suggest or motivate the use of a prophylactic composition.**

Squires does not teach, suggest, or motivate the claimed limitations of the present invention as asserted in the Office Action to meet a prima facie showing of obviousness. Squires teaches applying a topical medicament containing an effective dose of a viral inhibitor to a virus-caused wart located on a horse's muzzle in Example 14 located in column 28. The viral inhibitor taught in Squires is not a prophylactic compound as known in the art.

Squires discloses the use of virus inhibitors on animals and, in particular, a horse. Squires teaches a medical treatment and medicine used only for the treatment of a viral or bacterial infection or infectious disease after an animal has already been infected and is showing symptoms. Specifically, the only veterinary example of Squires invention, Example 14, teaches the topical treatment of a papilloma virus-caused wart (a pre-existing, virus-caused skin condition) on the muzzle of a two-year-old gelded thoroughbred horse.

As previously discussed, the present invention claims a method of applying a prophylactic composition to the exterior of the muzzle of a livestock animal. The term "prophylactic" is defined as "acting to defend against or prevent something, especially disease; protective." American Heritage Dictionary, 4th ed. The Advisory Action uses this accepted

definition to bolster the finding of obviousness by asserting that the function of a viral inhibitor is to act "to defend against."

Applicant traverses the assertion that a viral inhibitor as used in Squires is a prophylactic composition. The word defend is defined as "to make or keep safe from danger, attack, or harm." American Heritage Dictionary, 4th ed. When read in relation to the terms surrounding it, "defend," as used in the definition of prophylactic, means to prevent harm or danger from the attack of a disease. One uses a prophylactic composition to prevent, make safe or keep safe a body from infection by a disease. Therefore, a prophylactic composition prevents a disease from entering the body or, if the disease enters the body, a prophylactic composition makes or keeps a body safe and results in preventing a disease from causing harm, danger, or infecting a body. Applicant's definition is supported by the following definition of "prophylactic treatment" from a medical dictionary: "the institution of measures to protect a person from a disease to which he or she has been, or may be, exposed. *Also called a preventative treatment.*" American Heritage Medical Dictionary, 2009 (emphasis added).

In contrast, it is well known in the art that a viral inhibitor does not defend against or prevent a virus from entering a body or causing harm to or danger to a body but is a reactive treatment that inhibits the activity of a virus that has already penetrated and resides in the body. Inhibit is defined as "to hold back; or restrain" and in reference to biology, "to decrease, limit, or block the action or function of" (in this case) a virus. American Heritage Dictionary, 4th ed. Further, an inhibitor is defined as "one that inhibits, as a substance that retards or stops a chemical reaction." American Heritage Dictionary, 4th ed. It is well known in the art that prophylactics, one example being a vaccine, prevent a virus or other disease causing agent from affecting a subject. Viral inhibitors, however, are used to treat a subject and lessen the effects of

a virus that has already infected a subject. Viral inhibitors cannot prevent a subject from being infected with the virus in the first place. This distinction is well known in the art and is further supported by pages 2-5 of the chart of Exhibit B where vaccines are listed as preventative measures and viral inhibitors well known in the art are listed under "treatments." Moreover, Squires's disclosure further supports this distinction between prophylactic and treatment wherein the horse had already been infected with the papilloma virus and the topical medicament is used to treat the wart caused by the virus. The visible effect of the virus activity and infection, the wart, is already present. The harm and effect of the virus has already occurred.

The viral inhibitor does not prevent or defend the horse from contracting the virus or developing a wart, but instead slows down viral activity to lessen the severity of effects of the virus. After treatments with a viral inhibitor, the horse will likely develop another papilloma wart in the same or different location sometime in the future whereas a prophylactic composition, e.g., a vaccine, would prevent any effects from the virus in the first place. Another example is the treatment of HIV. It is well known in the art that there is no prophylactic composition to prevent a subject from being infected with HIV once exposed. It is also well known in the art that viral inhibitors are currently being used to retard and restrain the activity of the virus to prolong the onset of AIDS in HIV infected individuals, but the effects of the virus are inevitable in the long run. Accordingly, it is well known in the art that a viral inhibitor is not a prophylactic composition, but a reactionary treatment once infection has occurred.

**2. Squires does not teach, suggest or motivate the application of at least a single effective dose of a prophylactic composition directly to the exterior of the muzzle of an animal wherein the single effective dose is distributed to the oral and/or nasal cavities of said animal by the animal's tongue.**

Squires' disclosed composition is a topical medicament. The definition of "topical" for medical purposes is "of or applied to a localized area of the body or to the surface of a body part." American Heritage Dictionary, 4th ed. Topical medicaments are inherently meant to be effective and treat only the area to which they are applied. There is a well known distinction between a topical medicament and a topical application. The composition disclosed in Squires is a topical medicament. A topical medicament, as known in the art, is inherently meant to be effective and treat only the localized area of the body to which it is applied. On the other hand, the claimed carriers of Applicant's claim 29, namely, pastes, salves or films, are applied to the livestock animal's muzzle in order to allow the animal's tongue to deliver the effective dose to the oral and nasal cavities.

Squires exclusively teaches a topical medicament. All disclosed examples involving living organisms were applications to the skin with the intention to inhibit viral activity at that location. Examples 1-7 involved topical treatment of herpes lesions on human beings. Examples 8-13 contained testing of any possible dermatological allergic reaction induced by Squires composition on animal's ears and Example 14 is treatment of a wart on a horse's muzzle. All other examples are in-vitro tests performed in a lab outside a living organism.

In fact, the emphasis on the topical limitation of Squires's composition is so strong that, when Squires discloses the topical treatment, the reference definitively states that "an important aspect in this treatment was maintaining complete coverage of the affected area for the duration of the outbreak." (Col. 27, Lines 11-13). Squires itself discloses that a dose of its topical medicament becomes ineffective at treating a virus-caused outbreak (herpes sore or wart) when it is removed from the actual location of the outbreak.

Further, Squires's disclosure teaches that benzalkonium chloride, the preferred surfactant of the preferred embodiment of Squires's composition, "demonstrated high levels of toxicity to the cells even at high dilutions, which is medically unacceptable" during in vitro testing which also confirmed that the preferred embodiment of the composition is toxic in most of the tested dilutions. (Col. 13, lines 2-5; col. 30, lines 63-65; and col. 32, lines 25-27). As such, Squires's disclosure teaches using Squires's composition exclusively as a topical medicament and teaches away from any embodiment of the disclosed composition being applied to a living organism wherein Squires's composition would be ingested or absorbed by the living organism. If the animal distributes Squires's composition to its oral and nasal mucosa using its tongue, the animal would necessarily ingest or absorb some of the toxic compound. While ingestion and absorption of the compound is a foreseen, intended and relied upon consequence of the present invention, Squires teaches that the toxicity of its composition is medically unacceptable and poses a harmful threat to the animal if the animal ingests the preferred embodiments of Squires composition (the only embodiment for which test results exist and has been reduced to practice). Therefore, the Squires composition having a known toxic ingredient that is "medically unacceptable" is not safe for any other administration method than a topical medicament. Thus, ingestion or absorption of Squires composition would not be likely to achieve a positive effect on the health of the animal which necessarily teaches away from the application method of the present invention because one skilled in the art would not combine a composition known to include a toxic ingredient and shown in testing to be toxic with an administration method that includes distributing the composition to the animal's oral and/or nasal mucosa and subsequently ingesting the composition or absorbing it into the animal's bloodstream.

Moreover, both Squires and Reynolds fail to teach or suggest that the viral inhibitor is distributed to the oral and/or nasal cavities by the animal's tongue when the animal cleans its muzzle. Squires actually teaches away from this claimed limitation of the present invention—the distribution of a single effective dose to the oral or nasal mucosa using the animal's tongue. Squires and Reynolds do not teach a reliance on the tongue as an agent of distribution of the prophylactic composition. In fact, neither reference contains the word "tongue" in its disclosure. The Advisory Action and all previous Office Actions fail to show that Squires or Reynolds teaches or suggests that the composition is distributed to the oral and/or nasal cavity to contact the oral and nasal mucosa when the animal cleans its muzzle with its tongue.

**3. Reynolds does not teach, suggest, or motivate a person skilled in the art to use a UV or other non-visible dye as a post-identification identifier.**

The disclosure of a dye that becomes invisible is not a disclosure of a UV or other non-visible dye. The distinction being that a non-visible dye is still present on the animal and can be observed using a well known viewing lens, light spectrum or machine, whereas a disappearing dye can no longer be seen in any capacity. Therefore, the disappearing dye in Reynolds is a light visible dye until it disappears and cannot thereafter function as a post-application identifier because there are no means to detect the presence of the dye—which is the reason these disappearing dyes are used in the first place and also the reason such dyes are unsuitable for use in the present invention. Therefore, Squires and Reynolds do not disclose the claimed limitation of claim 34 and fail to teach, suggest or motivate a person skilled in the art to implement a UV or other non-visible dye as a post-application identifier.

**4. There is no rationale, articulation, or reasoned basis explaining how the present invention is an expected result of a person of ordinary skill in the art combining Squires and Reynolds.**

Squires and Reynolds, individually and in combination, fail to teach or suggest the combination asserted in the Office Action. Neither of the references teaches nor suggests, alone or in combination, all of the elements of independent claim 27 and 37 and no resultant method could have been created from these references that would meet the limitations of the present claims. Squires does not teach the use of a prophylactic compound. Squires teaches a preferred ingredient that displays high levels of toxicity when tested in vitro and is medically unacceptable; thus, Squires teaches away from combining this composition with any administration method that includes a reliance on the ingestion of the compound or the absorption of it into the blood stream as claimed in the present invention. Squires and Reynolds do not teach that the effective dose of the prophylactic composition is delivered to the nasal and/or oral mucosa by the animal's tongue and imposing this limitation into Squires and Reynolds is hindsight reconstruction because the Office Actions to date have failed to show this limitation as being taught or suggested in the cited references. Moreover, Squires and Reynolds also fail to teach the claimed limitation of a UV or other non-visible dye as a post-application identifier. Therefore, one of ordinary skill in the art would not have arrived at Applicant's claimed invention because Applicant's invention would not be an expected result of the combination of these references since both references, individually and in combination, fail to meet all the limitations of the subject claims. Accordingly, Applicant's independent claims 27 and 37 and the claims depending therefrom are nonobvious.

**I. Rejection of Claims 23, 28-30 and 33 over Squires in view of Reynolds and further in view of Callaghan.**

Claims 23, 28-30 and 33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Squires, in view of Reynolds and further in view of Callaghan (US 6,410,062). The Office Action asserts that "Callaghan teaches a topical formulation for treating a skin disorder." Regardless of the multitude of properties that are disclosed by Callaghan, Callaghan teaches a topical medicament. Per the arguments above in Section H, a topical medicament as disclosed in Callaghan and Squires does not create a reasonable expectation of the present invention when combined with Reynolds. Callaghan does not teach applying at least a single effective dose of a prophylactic composition directly to the exterior of the muzzle of a livestock animal. Callahan does not teach having the effective dose distributed to the animal's nasal and/or oral cavities to contact the oral and/or nasal mucosa by the animal's tongue. Therefore, Callahan, alone or in combination with Squires and Reynolds, does not provide a prima facie showing of obviousness of the present invention. Accordingly, Applicant's independent claim 27 and all the claims depending therefrom are nonobvious.

## IV. CONCLUSION

Applicant respectfully submits the claims and the application are in condition for allowance and such is courteously solicited. If any issue regarding the allowability of any of the pending claims in the present application could be readily resolved, or if other action could be taken to further advance this application such as an Examiner's amendment, or if the Examiner should have any questions regarding the present amendment, it is respectfully requested that the Examiner please telephone Applicant's undersigned attorney in this regard. Should any fees be

necessitated by this response, the Commissioner is hereby authorized to deduct such fees from Deposit Account No. 11-0160.

Respectfully submitted,

Date: 12-8-09

Lara S. Dickey
Reg. No. 48,161
Husch Blackwell Sanders LLP
4801 Main St., Suite 1000
Kansas City, MO 64112
816-983-8000
ATTORNEYS FOR APPLICANT

# Exhibit A

# Parts

When ordering please use the part numbers shown on the images below.

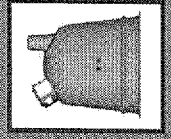
Online: www.eramask.com

Email: info@eramask.com

By phone: (+61 3) 9553 7200
Free call in Australia: 1800 006 956

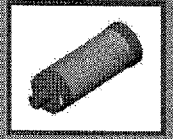
By Fax: (+61 3) 9553 7299

170270



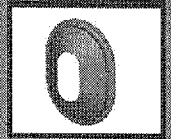
Mask Shell

170303



MDI Spacer

170265



Seal

170267

1.5 metre Strap with Quick Release Cord

170284

Non-Rebreathing Valves and Connector Assembly

170406

Nebuliser Pump High Flow 230V

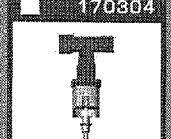
170373

Wet Nebuliser Bottle 6cc

170407

Nebuliser Pump High Flow 115V

170304



Wet Nebuliser Kit

# Caring for your ERA Mask

To clean the mask disconnect accessories, valves and connector assembly. Soak the parts and the shell in warm water with a mild detergent for 10-20 minutes. Drain and shake off excess water and allow to air dry. Do not heat sterilize the mask.

Check the seal and valves before use and replace if worn or damaged.

Store in a dry, well ventilated area away from direct sunlight and extreme temperatures.

DISTRIBUTED BY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BIOMEDTECH Australia Pty Ltd
17 Roberna Street, Moorabbin, Victoria, 3189
Ph: (03) 9553 7200 Fax: (03) 9553 7299
Freecall: 1800 006 956
Email: info@eramask.com
Web: www.eramask.com


# ERA® Mask

## A NEW ERA IN EQUINE RESPIRATORY TREATMENT

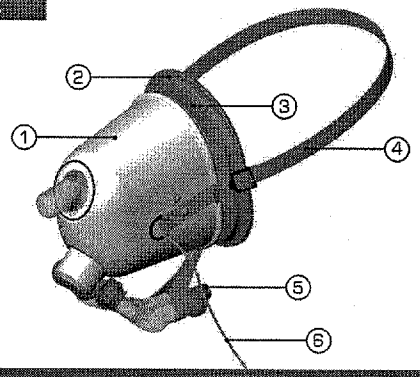
www.eramask.com

- Perfect and soft seal
- Safe quick release
- Small dead space
- Lightweight and rigid shell
- Versatile accessories
- Comfortable low resistance breathing
- Registered design, external breathing valves

# IHT Package

The IHT ERA Mask package has been developed for use with $GO_2$Altitude® Hypoxicators, a new drug free performance enhancing technology. The soft seal has been specifically designed to ensure that there is minimal leakage of ambient air into the mask during a simulated altitude training session. The minimal dead space eliminates carbon dioxide build up in the breathing circuit.

**170262**



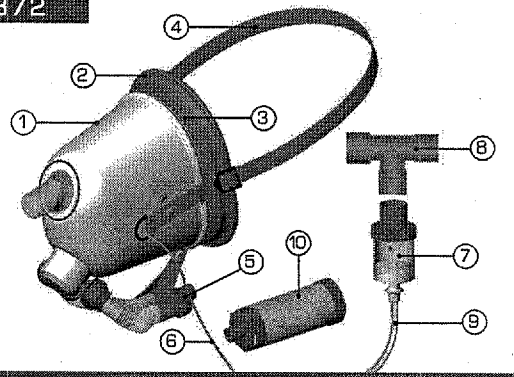

1. Mask Shell
2. Seal
3. Strap Hose Support
4. Strap 1.5 m Adjustable
5. Non-Rebreathing Valves and Connector Assembly
6. Quick Release Cord

* *spare seal and quality carry bag included in the package*

# Veterinary Package

The ERA Mask veterinary package provides a system to efficiently administer medication to the horse via a Metered Dose Inhaler (MDI) or Wet (Aerosol) Nebuliser. The excellent seal, small dead space and registered design non-rebreathing valves ensure that the horse gets the maximum benefit from the medication provided.

**170372**




1. Mask Shell
2. Seal
3. Strap Hose Support
4. Strap 1.5 m Adjustable
5. Non-Rebreathing Valves and Connector Assembly
6. Quick Release Cord
7. Wet Nebuliser Bottle
8. 3-way Connector
9. Tubing 1.8 m
10. MDI Spacer

* *spare seal and quality carry bag included in the package*

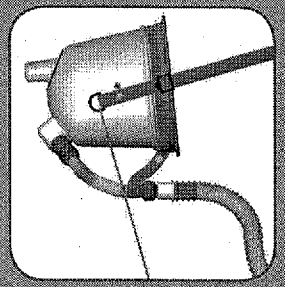
# SAFETY

1. Before administering any respiratory treatments for your horse please consult your veterinarian.
2. To ensure minimal distress to your horse fit the mask without any accessories attached. Once the horse is comfortable with the mask, accessories can be fitted to the connector ⑤. *Some horses will not be comfortable with wearing the mask.*
3. Always hold the quick release cord in case the horse becomes agitated and the mask needs to be removed quickly. If required, pull the cord ⑥ away from the mask, releasing the strap. The mask can now be removed or will be shaken off by the horse.
4. Refer to the information provided with the medication for dosage and correct application. If in doubt consult your veterinarian.
5. ERA Mask is intended for single horse use to prevent cross-contamination.

www.eramask.com

## How to Use ERA Mask with $GO_2$Altitude®

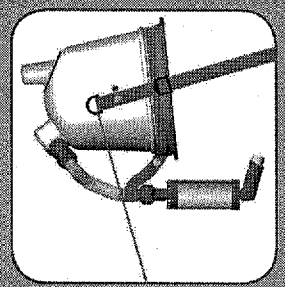
1. Please read the safety information carefully, before using ERA mask.
2. Place the mask onto the horse's muzzle.
3. Secure the strap behind the horse's ears and adjust if necessary.
4. Once the horse is comfortable with the mask, connect the hose from the $GO_2$Altitude hypoxicator onto the tube connector ⑤.



For more information on Equine Intermittent Hypoxic Training (IHT) please visit our web site http://www.go2altitude.com/horse.html

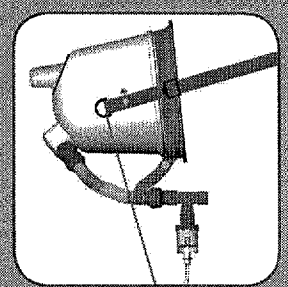
## How to Use ERA Mask with an MDI

1. Please read the safety information carefully, before using ERA mask.
2. Place the mask onto the horse's muzzle.
3. Secure the strap behind the horse's ears and adjust if necessary.
4. Prepare the MDI device as per its manufacturer's or veterinarian's instructions and insert into the MDI spacer ⑩.
5. Once the horse is comfortable plug the MDI Spacer ⑩ into the tube connector ⑤.
6. Operate the MDI as per the drugs usage or veterinarian's instructions.



## How to Use ERA Mask with a Wet Nebuliser

1. Please read the safety information carefully, before using ERA mask.
2. Place the mask onto the horse's muzzle.
3. Secure the strap behind the horse's ears and adjust if necessary.
4. Prepare the Nebuliser bottle ⑦ with dosage as per the drugs usage or veterinarian's instructions.
5. Connect the tube ⑨ from the pump and plug the bottle ⑦ into the 3-way connector ⑧.
6. Once the horse is comfortable, plug the assembled Nebuliser onto the tube connector ⑤.
7. Administer the medication as per the drugs usage or veterinarian's instructions.



# Equine AeroMask, The Effective Aerosol Drug Delivery System For Horses

## Equine AeroMask™ For Effective Metered Dose Inhaler/ Wet Nebulizer Aerosol Delivery

The Equine AeroMask™ was developed with veterinary clinical research assistance from the Firestone Equine Respiratory Research Laboratory at the Ontario Veterinary College, Guelph, Ontario, led by Dr. Laurent Viel, D.V.M., Ph.D. and David Tesarowski, Ph.D. As part of the clinical research, Equine AeroMask™ technology and metered dose inhalers (MDI's) were used to administer bronchodilatory to horses with heaves. The AeroMask™ MDI combination delivered 6 times the drug to the lung compared to a conventional wet nebulizer system*.

* *Tesarowski et al, CVJ, In Press. ** Viel et al, Company Report, 1997.*

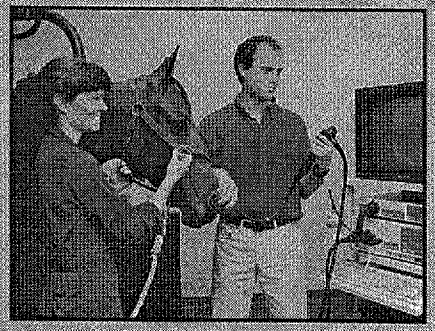
***NOTE:*** *The manufacturer recommends a veterinarian should be consulted to determine the appropriate drug dosage for your horse.*

MDI USAGE

1. Place Mask Over Horse's Muzzle. 2. Place Chamber Over Inhalation Port. 3. Shake MDI And Insert Into Chamber. 4. Actuate Medicament Into Chamber.

WET AEROSOL USAGE

1. Place Mask Over Horse's Muzzle. 2. Attach The 22mm Adaptor To Inhalation Port. 3. Attach The Wet Nebulizer With Holding Chamber In Just One. 4. Turn On The Air Compressor.

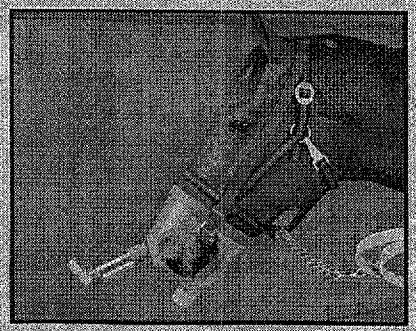


*An endoscopic examination at O.V.C., Guelph indicating inflamma*

## Equine AeroMask™ - Proven to be Clinically Effective

The light weight Equine AeroMask™ system offers a unique way to deliver inhaled medications using either metered dose inhaler or wet aerosol technology. The mask is made of sturdy transparent polycarbonate, features a silicone seal and valves for inspired and expired air. When fitted over the horse's nose, an MDI chamber with an MDI canister is attached to the inhalation valve at the front of the mask. By depressing the MDI canister, the medication is propelled into the chamber, through an inspiratory valve and into the mask, to be inhaled as the horse takes a normal breath. In a similar manner, when a small volume nebulizer with aerosol holding chamber is attached to the inhalation valve, the wet aerosol is inhaled as the horse takes a normal breath. Some dry powder inhalers will also attach directly to the inspiratory valve and the horse will inhale the medication in a normal breath.

Washing with mild soap and water between use is suggested but otherwise maintenance is not required, although occasional replacement of the valves is recommended. To avoid cross contamination it is best to have a mask for each horse.



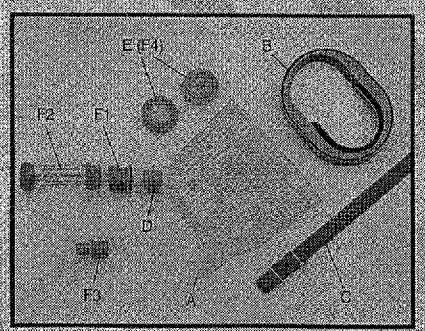
*The see through mask fits comfortably over the horse's muzzle and may be held in place using the adjustable straps.*

## Equine AeroMask™ With AeroVet™ Accessories

The Equine AeroMask™ is designed for easy assembly and operation.

55570001 Small Equine AeroMask™ Set (Foal/Newborn)
40570001 Medium Equine AeroMask™ Set (Thoroughbred/Standard)
56570001 Large Equine AeroMask™ Set (Warm Blood)
51570001 AeroVet™ Wet Nebulizer Aerosol System (Nebulizer & Chamber)
53570001 AeroVet™ Compressor 110V
52570001 AeroVet™ Compressor 220V
49570001 AeroVet™ 22mm Adaptor
41570006 AeroVet™ One-Way Valve 6/pack
42570001 AeroVet™ MDI Aerosol Holding Chamber
48570001 AeroVet™ Adaptor Boot
47570001 AeroVet™ Adaptor Tube
56572001 AeroVet™ Large Mask Shell
56571001 AeroVet™ Large Silicone Seal
46570001 AeroVet™ Medium Mask Shell
45570001 AeroVet™ Medium Silicone Seal
57570001 AeroVet™ Small Mask Shell
61570001 AeroVet™ Small Silicone Seal
58570001 AeroVet™ Ultrasonic Humidifier

The complete system includes: A. Mask Shell B. Silicone Seal/C. Strap Set/D. Adaptor Tube E. (3) One-Way Valves/F. Parts Kit, including: 1) Adaptor Boot, 2) MDI Aerosol Holding Chamber 3) 22mm Adaptor, 4) (4) Spare One-Way Valves. Also included is one AeroVet™ Wet Nebulizer Kit.




*The reusable mask can be completely disassembled for cleaning*

## Tear Off Reply Card

☐ **YES - I would like to know more about the Equine AeroMask™ and AeroVet™ Accessories**

Please send the following:

☐ Literature Package ☐ Name of a Local Distributor
☐ Complete Parts & Price List
☐ **YES - I would like to order the following:**
☐ 55570001 Small Equine AeroMask™ (Foal/Newborn)
☐ 40570001 Medium Equine AeroMask™ (Thoroughbred/Standardbred)
☐ 56570001 Large Equine AeroMask™ (Warm Blood)
☐ 51570001 AeroVet™ Wet Nebulizer Aerosol System (Nebulizer & Chamber)
☐ 53570001 AeroVet™ Compressor 110V
☐ 52570001 AeroVet™ Compressor 220V
☐ 49570001 AeroVet™ 22mm Adaptor
☐ 41570006 AeroVet™ One-Way Valve 6/Pack
☐ 42570001 AeroVet™ MDI Aerosol Holding Chamber
☐ 48570001 AeroVet™ Adaptor Boot
☐ 47570001 AeroVet™ Adaptor Tube
☐ 56572001 AeroVet™ Large Mask Shell
☐ 56571001 AeroVet™ Large Silicone Seal
☐ 46570001 AeroVet™ Medium Mask Shell
☐ 45570001 AeroVet™ Medium Silicone Seal
☐ 57570001 AeroVet™ Small Mask Shell
☐ 61570001 AeroVet™ Small Silicone Seal
☐ 58570001 AeroVet™ Ultrasonic Humidifier

Please state quantities. Visa, Mastercard and American Express accepted. You may call your order direct.
Toll free: (800) 465-3296

**Please send my order to:**

Name: _____

Street: _____

City: _____

State/Prov: _____ Zip/Postal: _____

Phone Number: _____

## How Respiratory Illness Affects Horses

Respiratory problems in horses can account for a significant percentage of the adverse causes that may temporarily or permanently reduce the anticipated performance levels of up to 75% of the racetrack, work and pleasure horse population[1].

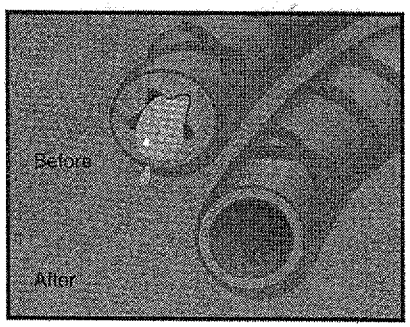
Respiratory diseases may take different forms throughout the life of a horse. Yearlings and two to three year olds, entering the racetrack, are most susceptible to influenza and rhinopneumitis. The equine ventilatory environment and exposure to recurring viruses may cause coughing and decreased airway responsiveness lasting from a few days up to several months.

Progressive clinical signs of this disorder are persistent with intermittent cough, poor exercise tolerance, appearance of an abdominal lift, and finally severe respiratory distress[2].

There are several publications demonstrating that a large number of inflammatory cells retrieved from broncho-alveolar lavage (B.A.L.) are located in the airway and contribute to airway hyperactivity, excess mucus production and obstruction of the airways.

[1] *Ingram, R.G., Respiratory diseases of horses at Ontario Veterinary College, University of Guelph CVJ:1-47, 1976.*

[2] *Derksen et al, 1988 Am. Rev. Respir. Dis. 133, 357-361.1986.*




*Respiratory distress occurs when airways become inflamed from allergic irritants such as mold or dust. When properly treated*

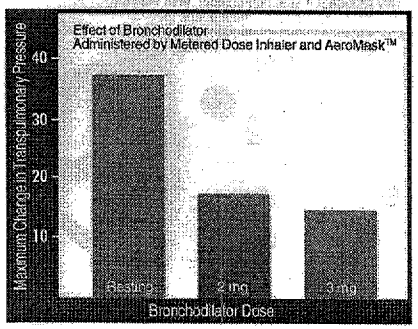
## Benefits of Aerosol Treatment

The Equine AeroMask™ has been designed to be used with metered dose inhaler (MDI's) medicated particles or wet nebulizer aerosols by directly targeting the airway and lungs. The Equine AeroMask™ provides a targeted method of delivery by accurately directing concentrated medication to the lungs and small airways. The Equine AeroMask™ also effectively regulates dosage and significantly reduces systemic side effects.

The initial goal of therapy is to control inflammation and reverse airflow obstruction. Once the horse is stabilized, a preventative maintenance program can be implemented.

Administration of the therapy using MDI's can be efficiently completed within five minutes. This is important to both horse and trainer, as it allows more time to be spent on exercise programs designed to reach optimal performance. For the owner, this represents an opportunity to reduce labor expenses attached to other more time consuming and less effective methods of treatment. Effective care of a horse afflicted with chronic obstructive pulmonary disease, serves to increase the quality and length of the horse's working life, and maximizes the horse owner's pleasure and investment[3].

[3] *Tesarowski et al, The rapid and effective administration of a $\beta_2$- agonist to horses with heaves using a compact inhalation device and metered-dose inhalers. CVJ, Vol. 35, March, 1994.*




*Graph shows the results of a study utilizing the Equine AeroMask™ for the treatment of C.O.P.D. horses conducted by Drs. Laurent Viel*

## Developed For The Equine Industry

Treatment objectives in horses with small airway diseases include controlling airway inflammation and alleviating airway obstruction. This may be achieved to a certain extent by limiting exposure of environmental irritants such as molds and dust present in feed and bedding and by providing adequate ventilation. Further reduction in the severity of disease does however require a progressive therapy regime.

Current treatments consist of oral, injectable and nebulization medications administered on a daily basis for a long period of time (4-6 weeks). Oral bronchodilators have been used and can be beneficial but, to be effective, the medication must be given twice daily to maintain optimum airway function. While corticosteroids are sometimes beneficial in oral form when severe airway inflammation is present, oral administration means the medication will be distributed in all body organs to take effect. This can cause serious side effects such as reduced activity of the immune system and imbalance of endogenous steroid control.

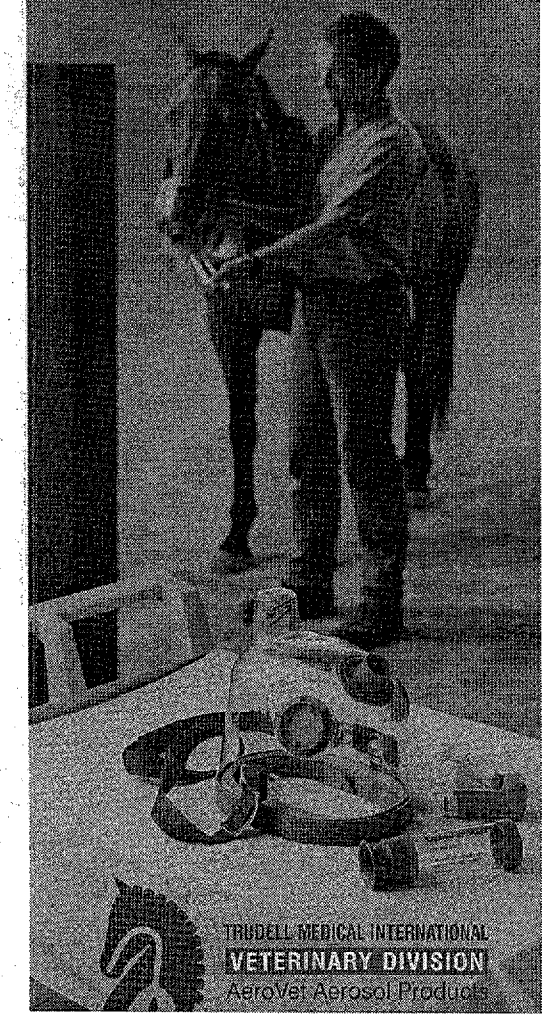
The Equine AeroMask™ eliminates all of these potentially serious problems and represents a clinically designed alternative drug delivery system using aerosol therapy technology proven in human use, to treat horses affected with small airway disease.

For Further Information On The Equine AeroMask™ And AeroVet™ Accessories, Fill In The Detachable Form Section And Return To:

**TRUDELL MEDICAL INTERNATIONAL**
**725 Third Street**
**London, Ontario, Canada N5V 5G4**
**Tel: (519) 455-7060 / Fax: (519) 455-6329**

The Effective Aerosol Drug Delivery System For Horses

# Equine AeroMask™ And AeroVet™ Accessories



TRUDELL MEDICAL INTERNATIONAL
**VETERINARY DIVISION**
AeroVet Aerosol Products

# Exhibit B

# Virus disease

From Wikipedia, the free encyclopedia
(Redirected from Virus infections)

These are **tables of the clinically most important**[1] **viruses**. A vast number of viruses cause infectious diseases, but these are the major ones.

**Virus disease**

*Classification and external resources*

**MeSH** D014777
(http://www.nlm.nih.gov/cgi/mesh/2009/MB_cgi?field=uid&term=D014777)

## Contents



## Structural characteristics

Basic structural characteristics, such as genome type, virion shape and replication site, generally share the same features among virus species within the same family:

**Comparison table of clinically important virus families and species**

| Family | Baltimore group | Important species[2] | envelopment [2] | Virion shape [2] | Replication site[2] |
|---|---|---|---|---|---|
| Adenoviridae | dsDNA | *adenovirus* | non-enveloped | icosahedral | nucleus |
| Picornaviridae | +ssRNA | coxsackievirus, hepatitis A virus, poliovirus | non-enveloped | icosahedral | |
| Herpesviridae | dsDNA | Herpes simplex, type 1, Herpes simplex, type 2, Varicella-zoster virus, Epstein-barr virus,Human cytomegalovirus, Human herpesvirus, type 7, Human herpesvirus, type 8 | enveloped | | nucleus |
| Hepadnaviridae | dsDNA and ssDNA | Hepatitis B virus | enveloped | icosahedral | nucleus |
| Flaviviridae | +ssRNA | Hepatitis C virus, yellow fever virus, dengue virus, West Nile virus, other Flaviviruses | enveloped | icosahedral | |
| Retroviridae | +ssRNA | Human immunodeficiency virus (HIV) | enveloped | | |

| | | | | | |
|---|---|---|---|---|---|
| Orthomyxoviridae | -ssRNA | Influenza virus | enveloped | spherical | nucleus[3] |
| Paramyxoviridae | -ssRNA | Measles virus, Mumps virus, Parainfluenza virus, Respiratory syncytial virus,Human metapneumovirus | enveloped | spherical | |
| Papillomaviridae | dsDNA | Papillomavirus | non-enveloped | icosahedral | nucleus |
| Rhabdoviridae | -ssRNA | Rabies virus | enveloped | helical, bullet shaped | |
| Togaviridae | +ssRNA | Rubella virus | enveloped | icosahedral | |
| Parvoviridae | ssDNA | Human bocavirus, Parvovirus B19 | enveloped | icosahedral | |

# Clinical characteristics

The clinical characteristics of viruses may differ substantially among species within the same family:

| Type | Family | Transmission [2] | Diseases[2] | Treatment[2] | Prevention[2] | laboratory |
|---|---|---|---|---|---|---|
| *adenovirus* | adenoviridae | ▪ droplet contact (mainly)<br>▪ fecal-oral<br>▪ venereal<br>▪ direct contact (ocular infections) | ▪ acute febrile pharyngitis<br>▪ pharyngoconjunctival fever<br>▪ epidemic keratoconjunctivitis<br>▪ infantile gastroenteritis | None | None[4] | ▪ virus<br>▪ hema assay<br>▪ ELIS |
| Coxsackievirus | Picornaviridae | fecal-oral, droplet contact | Coxsackie infections | None | None | Cell culture detection |
| Epstein-Barr virus | Herpesviridae | Saliva | ▪ infectious mononucleosis<br>▪ Burkitt lymphoma | None | None | ▪ Antib<br>▪ immu<br>▪ ELIS<br>▪ Nucl detec |
| | | | | Immunoglobulin | ▪ Vaccine<br>▪ immunoglobulin | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Hepatitis A virus | Picornaviridae | fecal-oral | acute hepatitis | (post-exposure prophylaxis) | (post-exposure prophylaxis)<br>▪ avoid food-contamination | antibody de |
| Hepatitis B virus | Hepadnaviridae | ▪ All body fluids (blood, semen, saliva, mother's milk etc.) | ▪ acute hepatitis<br>▪ chronic hepatitis<br>▪ hepatic cirrhosis<br>▪ hepatocellular carcinoma | ▪ immunoglobulin<br>▪ Adefovir[5]<br>▪ Entecavir[5]<br>▪ Pegylated interferon alfa-2 [5]<br>▪ Lamivudine[5] | ▪ vaccine<br>▪ immunoglobulin (perinatal and post-exposure prophylaxis) | ▪ viral<br>▪ antib<br>▪ nucle |
| Hepatitis C virus | Flaviviridae | ▪ blood<br>▪ (sexual) | ▪ acute hepatitis<br>▪ chronic hepatitis<br>▪ hepatic cirrhosis<br>▪ hepatocellular carcinoma | ▪ Pegylated interferon alfa-2<br>▪ Ribavirin[5] | None | ▪ antib<br>▪ nucle |
| Herpes simplex virus, type 1 | Herpesviridae | direct contact with saliva and lesions | ▪ primary HSV-1 infection<br>▪ (gingivostomatitis in children, tonsillitis & pharyngitis in adults, keratoconjunctivitis)<br>▪ latent HSV-1 infection (herpes labialis, cold sores) | ▪ acyclovir<br>▪ famciclovir<br>▪ foscarnet<br>▪ penciclovir | None | ▪ immu<br>▪ immu<br>▪ nucle |
| Herpes simplex virus, type 2 | Herpesviridae | ▪ sexually<br>▪ birth | ▪ primary HSV-2 infection<br>▪ latent HSV-2 infection<br>▪ aseptic meningitis | ▪ acyclovir<br>▪ famciclovir<br>▪ foscarnet<br>▪ penciclovir<br>▪ cidofovir | ▪ contact-avoidance with lesions<br>▪ safe sex | ▪ cell c<br>▪ immu<br>▪ immu<br>▪ nucle |
| cytomegalovirus | Herpesviridae | ▪ tears<br>▪ urine<br>▪ semen<br>▪ saliva<br>▪ vaginal secretions | ▪ infectious mononucleosis<br>▪ Cytomegalic inclusion | ▪ ganciclovir<br>▪ cidofovir | None | antibody an detection |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | ▪ mother's milk<br>▪ crosses placenta<br>▪ blood | disease | ▪ foscarnet | | |
| Human herpesvirus, type 8 | Herpesviridae | | ▪ Kaposi sarcoma<br>▪ multicentric Castleman disease<br>▪ primary effusion lymphoma | many in evaluation-stage | None | Nucleic aci detection |
| HIV | Retroviridae | ▪ sexual<br>▪ blood<br>▪ mother's milk | AIDS | HAART | ▪ zidovudine (perinatally)<br>▪ blood product screening<br>▪ safe sex | ▪ nucle<br>▪ p24<br>▪ antib |
| Influenza virus | Orthomyxoviridae | droplet contact | ▪ influenza<br>▪ (Reye syndrome) | ▪ amantadine<br>▪ rimantadine<br>▪ zanamivir<br>▪ oseltamivir | ▪ Influenza vaccine<br>▪ amantadine<br>▪ rimantadine | ▪ Hema assay<br>▪ antig |
| measles virus | Paramyxoviridae | droplet contact | ▪ measles<br>▪ postinfectious encephalomyelitis | None | MMR vaccine | antibody de |
| Mumps virus | Paramyxoviridae | droplet contact | Mumps | None | MMR vaccine | antibody de |
| Human papillomavirus | Papillomaviridae | direct contact | ▪ hyperplastic epithelial lesions (common, flat, plantar and anogenital warts, laryngeal papillomas, epidermodysplasia verruciformis) 55+ (hands/ feet) 30+ (anogenital/ some are oral/ throat/ respiratory)<br>▪ Malignancies for some species (cervical carcinoma, squamous cell carcinomas) | ▪ liquid nitrogen<br>▪ laser vaporization<br>▪ cytotoxic chemicals<br>▪ interferon<br>▪ cidofovir | ▪ HPV vaccine<br>▪ wart tissue avoidance<br>▪ safe sex | ▪ Visu<br>▪ Antig<br>▪ Nucl detec |

| | | | | | | |
|---|---|---|---|---|---|---|
| Parainfluenza virus | Paramyxoviridae | droplet contact | ▪ croup<br>▪ pneumonia<br>▪ bronchiolitis<br>▪ common cold | None | None | Antibody d |
| Poliovirus | Picornaviridae | fecal-oral | Poliomyelitis | None | Polio vaccine | Antibody d |
| Rabies virus | Rhabdoviridae | ▪ Animal bite<br>▪ droplet contact | Rabies | Post-exposure prophylaxis | Pre- and postexposure prophylaxis | Histology ( |
| Respiratory syncytial virus | Paramyxoviridae | droplet contact, hand-to-mouth | ▪ bronchiolitis<br>▪ pneumonia<br>▪ influenza-like syndrome<br>▪ severe bronchiolitis with pneumonia | (ribavirin) | ▪ hand-washing<br>▪ avoidance<br>▪ palivizumab in high risk individuals | antibody an detection |
| Rubella virus | Togaviridae | droplet contact | ▪ German measles<br>▪ congenital rubella | None | MMR vaccine | Antibody d |
| Varicella-zoster virus | Herpesviridae | droplet contact | ▪ Varicella<br>▪ herpes zoster | **Varicella**:<br>▪ acyclovir<br>▪ famciclovir<br>▪ valacyclovir<br>**Zoster**:<br>▪ acyclovir<br>▪ famciclovir | ▪ Varicella vaccine<br>▪ varicella-zoster immuneglobulin | ▪ Cell c<br>▪ antig acid c |

## See also

- List of latent human viral infections
- Pathogenic bacteria

## References

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2. ^ *a b c d e f g h i* Unless else specified in boxes, the ref is: Fisher, Bruce; Harvey, Richard P.; Champe, Pamela C. (2007). *Lippincott's Illustrated Reviews: Microbiology (Lippincott's Illustrated Reviews Series)*. Hagerstown, MD: Lippincott Williams & Wilkins. ISBN 0-7817-8215-5. Pages 354-366
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